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**APPLICATION  
FOR  
UNITED STATES PATENT**

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**Title:** OVER-WRAPPED CARTON AND ASSOCIATED  
PRODUCTION METHOD

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**SPECIFICATION**

**OVER-WRAPPED CARTON AND ASSOCIATED  
PRODUCTION METHOD**

**Background of the Invention**

This invention relates to cartons. More specifically, this invention relates to an improved carton and associated production method.

5                   Beverages, such as soda or beer, often come in  
cylindrical, typically aluminum, 12 ounce cans. Traditionally, cans of  
soda and beer are sold in packs of 12 cans. The 12 pack is typically  
rectangular paperboard with the cans, usually in a 4 x 3 or 6 x 2 matrix  
arrangement stacked closely to one another. Commonly, the carton is  
10 constructed of thick paperboard with graphic designs printed thereon.  
Conventional methods for producing paperboard can cartons (e.g., for  
six, twelve or more cans of soft drink) tend to force the carton  
manufacturer's customers (e.g., soft drink canners) to anticipate needs

for soft drink packaging well in advance of a desired can run for packaged product to be distributed to the canners' customers e.g. (retail outlets such as grocery stores or delicatessens). Beverage canners generally produce and can particular beverages (e.g., colas, 5 lemon drinks, etc.) on a cyclic basis. That is, particular beverages are scheduled to be produced and canned at preset intervals, for instance, on a weekly or semi-weekly basis. However, an unexpected large production run of a particular beverage, without a great deal of lead time, may be required of a can carton manufacturer from time to time 10 so that the canner can satisfy periodic unexpectedly large orders for a particular style of beverage carton.

Beverage canners also periodically present certain promotional schemes to retain consumers, such as contests, from time to time. These business situations created by a carton manufacturer's 15 customers cause the manufacturer to ramp down production of a normal carton style in favor of a promotional carton style, or to extend production of one normal carton style at the expense of other carton styles. Conventional beverage can carton manufacturing tends to be inefficient when it is forced to be flexible, and when it must fill 20 unexpected volume orders, or orders requiring new unexpected graphic designs. And there is significant expense associated with a promotional scheme that is not as successful as expected. For example, and in accord with the prior art, a manufacturer might print hundreds of thousands of cartons with a graphic design for a soft drink

promotion. If that promotion is not successful and many of the can cartons are not needed, the promotional can cartons are simply destroyed at great expense to the soft drink manufacturer due to the expensive printed paperboard upon which the promotional graphic design had been printed.

One known prior art carton production method uses special clay-coated paperboard. When used to fabricate can cartons, the coated board is drawn in a web from a roll of paperboard, the clay-coated surface is printed with a desired graphic design, and the web is then die cut into multiple individual carton blanks. The printed carton blanks are then transferred within the same carton manufacturing facility to a folder/glue machine where each is folded and glued into a flattened sleeve or fill-ready carton configuration. The flattened cartons are then packed and palletized for shipment to a customer, e.g. a beverage canner.

This conventional carton production method requires the carton manufacturer to reconfigure the clay-coated board printer on an order-by-order basis, i.e., requires significant amounts of machinery down time during a printing changeover from a first graphic design to a second graphic design. Also, print quality of ink on clay-coated board is limited. Not only do clay-coated paperboard graphics tend to be dull, but the ink used also tends to smudge. As the ink smudges on the clay-coated paperboard, the ink rubs off on the production machinery which must be cleaned often and regularly at significant expense due

to loss of production run time during cleaning. Dullness of the graphic design on clay-coated paperboard results from printing on a relatively coarse substrate. Another problem associated with printing on clay-coated paperboard stems from "board dust" which accumulates upon, for example, an impression roller of a printing plate, causing poor ink transmission from the impression roller to the paperboard substrate. Of course, additional downtime to clean the machinery of board dust also results in lost production run time and, therefore, lost sales revenue.

Another shortcoming of this prior art clay-coated board beverage carton method is that significant time can be lost by having an omnibus carton manufacturer produce cartons for several different beverage canners which package beverages at numerous plants geographically distant from the carton manufacturing plant. The omnibus manufacturer is required to reconfigure the printing apparatus for every new carton order that is different from the previous order. Beverage canners are thus required to factor into their carton orders the amount of time necessary for a distant carton manufacturer to ramp-up production of a specific carton design and ship cartons to the beverage canner. As a result, the carton manufacturer's prior art production method acts as a limit to the spontaneity of the carton needs by the beverage canner who might periodically require urgent carton orders to be filled.

Another carton manufacturing method known to the prior art suffers from the same kinds of shortcomings discussed above.

This process of making can cartons includes a roll of film that is first reverse printed, is then laminated to non-clay-coated paperboard, and

5 is then die cut into multiple carton blanks, all in a single operation at a single production site. The laminated carton blanks are then

processed and shipped to a customer. Note this process takes place in a single operational sequence at a single carton manufacturing

location. While reverse printing a roll of film results in higher quality

10 graphics than ink printing on clay-coated board, the carton customer still must factor in the time it takes for the carton manufacturer to

change graphic design printing in the single step process as well as the time for the carton manufacturer to ship the partially assembled carton

blanks to the distant customer, when placing a carton order. In other

15 words, this prior art method does not solve the relatively long lead time that a carton user must consider when placing an order.

Another shortcoming of these and other prior art beverage carton production techniques is the excessive consumption of paperboard due to the space limitations and inefficiencies of  
20 arranging the substrates on the paperboard web.

### **Summary of the Invention**

The above-identified problems and others in the prior art are solved by this invention. This invention in one embodiment

involves the replacement of the printed paperboard beverage carton with a generically printed or blank paperboard carton which is later over-wrapped with a printed film that may be applied in the customer's bottling plant or canner after filled bottles or cans are inserted therein and the paperboard carton erected.

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By utilizing the over wrap concept of this invention, converters such as the assignee of this invention, The C.W. Zumbiel Company, which produce the paperboard cartons can reduce the paperboard consumption and requirements for each individual carton while still providing appropriate coverage and concealment for the UPC codes on the cans within the carton. Once the carton has been over-wrapped with the solid film, the customer must still be able to penetrate the over wrap to utilize a handle or dispenser formed in the die-cut paperboard carton. This will be accomplished by perforating the over wrap film in registration (before or after it is applied to the filled carton) with either a low powered laser, a heated perforation die or other appropriate devices according to various embodiments of this invention.

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An over wrap printed film applied to a paperboard carton according to this invention to date has not been suitable for cartons in which utility demands that the consumer be able to penetrate the film without releasing product from the package. With a carton of canned beverages, the consumer must be able to penetrate the over wrap film to access the paperboard handle in the carton without disturbing the

integrity of the carton. Furthermore, consumers must also be able to utilize the die-cut dispensing features included on many paperboard cartons without disturbing the remainder of the carton structure.

Access to the dispensing features which are die cut into the

5 paperboard carton can also be accomplished with perforations applied to the over wrap film.

By utilizing a generically printed or blank paperboard carton substrate and then applying an over-wrapped printed film onto the erected carton filled with beverage cans or the like, the amount of paperboard material utilized is reduced. For example, by utilizing this invention, the dust flaps commonly used in many known paperboard carton blanks or substrates can be removed or reduced in size while still allowing the carton to conceal the UPC codes on the cans within the carton. Concealment of the UPC codes on the cans is important to the canner because it eliminates the need to carry two separate can inventories, one for single serve cans and one for use in multi-pack cartons. Elimination or reduction of the dust flaps on the paperboard blank allows the blanks to be more efficiently and compactly nested with each other on the paperboard web. A deeper or more efficient nesting configuration for use on the web and press will ultimately result in less paperboard consumption and a more economically efficient production of the carton (see U.S. Patent No. 5,108,030, incorporated by reference herein).

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Moreover, an additional benefit of this invention is that the number of customized carton blanks for the various beverage canners is drastically reduced. Converters, such as the assignee of this invention, will be able to eliminate all but a select few carton blank designs and associated unique dies and production requirements while still offering specific carton graphics and designs. This significantly reduces inventory and storage requirements while affording more efficient and timely carton production.

The ability to both save on the paperboard substrate material requirements and provide a perforated film after the product has been inserted into the paperboard carton will allow this invention to be utilized as a low cost replacement for the traditional paperboard carton and associated production method.

In one embodiment of the present inventive method, plural, film webs are each pre-printed with a different graphic design. The plural pre-printed film webs are stored at the canning or bottling site for future use as pre-printed film to be over-wrapped onto the filled cartons. In response to a customer order, a selected pre-printed film web with a desired graphic design is chosen from the plural pre-printed film rolls in storage. The blank or generically printed cartons are shipped from the converter to the bottler in a ready-to-fill condition. Once the cartons are filled, the web of the selected pre-printed film roll is then over-wrapped onto the carton.

In a second embodiment of the present invention, plural film webs are each printed with a different graphic design at a satellite geographic site, as discussed above. Satellite geographic sites are provided which are geographically proximate beverage canning operations, those operations being relatively geographically distant from the master converter site. Blank or generically printed cartons, filled or not, are produced at the master converter site, remote from the satellite site. In response to a customer order from a customer proximate to the satellite site but relatively geographically distant from the master converter site, a selected pre-printed film roll is removed from storage at the satellite site and transported to the canner or customer. At the canner, the film is over-wrapped with the paperboard carton.

The film web printing in one embodiment of this invention can be accomplished with digital printing techniques which offer visual and graphic clarity and ease of production. Such printing may be accomplished at the converter's plant or other locations as described herein.

Thus, a method of fabricating cartons is provided which is able to respond immediately to a customer order simply by choosing a selected pre-printed film roll from a number of different pre-printed film rolls, and then over-wrapping the film to a blank or generically printed carton, filled or not. The inventive process therefore enables unexpected can carton orders to be filled quickly without any

changeover time between graphic design printing operations being required for the carton manufacturing machinery.

5                   The inventive process is also less expensive than conventional processes because less paperboard is required and there is less waste of unused printed cartons.

                  The above and other objects and advantages of this invention shall be made apparent from the accompanying drawings and the description thereof.

**Brief Description of the Figures**

10                   The objectives and features of the invention will become more readily apparent from the following detailed description taken in conjunction with the accompanying drawings in which:

                  Fig. 1 is an exemplary schematic representation of a carton production method according to one embodiment of this  
15                   invention;

                  Fig. 2 is a perspective view of one embodiment of an over wrap film applied to a paperboard carton according to this invention; and

                  Fig. 3 is a view similar to Fig. 2 with the over wrap film  
20                   modified to provide access to and use of certain features of the carton such as the die cut handle and dispenser.

**Detailed Description of the Invention**

Referring to Figs. 1-3, an exemplary embodiment of a production method 10 for filled over-wrapped beverage packages 38 according to this invention is shown. While the invention is described and shown herein with respect to cartons for beverage cans 14, beverage bottles or the like, it should be readily appreciated that this invention is not limited to cartons or packages 38 for any particular product and it can be readily utilized for a wide variety of packaged materials and carton types.

According to one embodiment of this invention, a carton blank or substrate 16 as shown in Fig. 1 is produced at a first site 18 by a converter, such as the assignee of this invention, The C.W. Zumbiel Company. Carton blanks 16 of this type are very well known in the art and examples are shown in U.S. Patent Nos. 6,632,163; 5,947,367; 5,197,656, each of which is hereby incorporated by reference in its entirety. The carton blanks 16 are typically die cut from a web of paperboard material, preferably having a thickness of about 0.017 inches and, more preferably, about 0.015 inches thick. According to this invention, the paperboard carton blank 16 is either not printed (i.e., blank) or generically printed with simple identification indicia. In other words, the paperboard carton blank or substrate 16 produced by the converter at a first site 18 is not printed with appropriate graphics or other indicia for retail sale.

Preferably, each carton blank or substrate 16 has a user convenience feature 24 die cut or otherwise included therein.

Examples of such convenience features 24 are a die cut handle 24a or die cut dispensing feature 24b by which a user may puncture or

5 penetrate the filled paperboard carton 12 for carrying the filled carton

or package or accessing the contents 14 for distribution and/or

consumption. Die cut handles 24a and dispensing features 24b may

come in a variety of designs and configurations, each of which is

compatible with this invention. Examples of a handle and a dispenser

10 for the carton are shown in U.S. Patent Nos. 5,106,014 and 5,249,681,

each of which is hereby incorporated by reference in its entirety.

The paperboard carton blanks or substrates 16 are

arranged on a web (not shown) from a roll of paperboard and die cut or

otherwise defined thereon. Once the web is die cut into multiple

15 individual carton blanks 16, they are transferred at the same converter

site 18 to a folder/gluer machine (not shown) where each is folded and

glued into a flat sleeve or fill-ready carton 20 configuration. The

flattened sleeves or cartons 20 are then packed and palletized for

shipment to a geographically distant site 22 such as a customer, a

20 beverage canner, bottler or the like. The unfilled cartons 20 are then

erected and filled with the beverage cans 14, bottles or other items at

the customer's facility 22.

Once the carton 20 is filled at the customer, canner,

bottler or similar facility 22, it is over-wrapped with a preprinted film 26

having a desired graphic representation 28 printed on the film 26. In one embodiment of this invention, the film 26 is produced from a roll 30 of film material and preferably has a thickness of about 0.0005 inches to about 0.001 inches and is a polypropylene film of the type available from AET Films of Terre Haute, Indiana. Alternatively, the film 26 of this invention may be a printed paper or any other suitable material. As will be readily appreciated by those of ordinary skill in the art, the film 26 is sized and configured to be compatible with the dimensions of the filled carton 12. Additionally, a variety of films 26 have different graphic representations 28 thereon and may be provided at the canner or bottler facility 22 for selection to be over-wrapped onto the filled carton 12.

Referring to Fig. 2, the film 26, when over-wrapped onto the filled carton 12, initially covers and conceals the convenience features 24 of the carton 20, such as the handle 24a and dispensing opening 24b. The preprinted film 26 may be produced on-site 22 at the bottler/canner or shipped to that facility from a satellite film printing site (not shown) according to various embodiments of this invention.

After the film 26 is over-wrapped onto the filled carton 12, the film 26 is perforated, scored or otherwise processed 32 to provide convenient access to the convenience features 24 formed in the carton 20. In one embodiment as schematically shown in Fig. 1, the film 26 is scored or perforated 32 with a low power laser 34 along score lines 36 of the convenience features 24 in the carton 20. Alternatively, a heat

perforated die or other suitable device may be used to score the over-wrap film 26 after it is applied to the carton 12 or prior to being over-wrapped on the carton 20 for alignment with the convenience features 24. As such, a user will be able to easily access and tear the

5 paperboard carton 20 to utilize the convenience feature 24 such as a handle 24a or dispensing feature 24b without disturbing the contents 14 of the carton 12 or mutilating the entire carton 12.

As shown in Fig. 3, once the film 26 is scored, perforated or otherwise processed 32, a package 38 for retail sale and use by the

10 consumer is available for shipment. Compared to currently available cartons and packages, this carton is produced more economically and efficiently for on-demand delivery.

The present inventive method 10 is able to respond to a customer order more efficiently than conventional processes by storing

15 pre-printed film 26 with a variety of different but desired graphics 28 at the site 22 prior to a need for use. The present inventive method provides substantial cost and time savings by obtaining the selected pre-printed film 26 from storage at the site 22 to be over-wrapped with the paperboard carton 12 without having to reconfigure the film printing

20 apparatus every time a customer order is received.

From the above disclosure of the general principles of this invention and the preceding detailed description of at least one preferred embodiment, those skilled in the art will readily comprehend the various modifications to which this invention is susceptible.

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Therefore, I desire to be limited only by the scope of the following claims and equivalents thereof.

I claim: